What is claimed is:

1) A semi-crystalline, largely isotropic, carbon foam produced from particulate high volatile bituminous coal exhibiting a free swell index of between about 3.5 and about 5.0 and of a small diameter, said carbon foam having a density of between about 0.1 and about 0.8 g/cm$_3$ and a thermal conductivity below about 1 W/m/°K.

2) The carbon foam of claim 1 wherein said coal exhibits a free swell index of between about 3.75 and about 4.5.

3) The carbon foam of claim 2 having a compressive strength below about 6000 psi.

4) The carbon foam of claim 2 that has been carbonized.

5) The carbon foam of claim 2 that has been graphitized.

6) A method for producing a carbon foam from a high volatile bituminous coal exhibiting a free swell index of between about 3.5 and about 5.0 comprising:

    A) comminuting said high volatile bituminous coal to a small particle size to form a ground coal;

    B) placing said ground coal in a mold;

C) heating said ground coal in said mold under a non-oxidizing atmosphere to a temperature of between about 300° C and about 700° C and soaking at this temperature for a period of from about 10 minutes to about 12 hours to form a preform; and

D) controllably cooling said preform.

7) The method of claim 6 wherein said high volatile bituminous coal exhibits a free swell index of between about 3.75 and about 4.5.

8) The method of claim 7 wherein said inert atmosphere is applied at a pressure of from about 0 psi up to about 500 psi.

9) The method of claim 7 wherein said temperature is achieved using a heat-up rate of between about 1° C to about 20° C per minute.

10) The method of claim 7 wherein said controlled cooling is accomplished at a rate of less than about 10° C/min to a temperature of about 100° C.

11) A laminated sheet comprising:

A) a pair of skins laminated to either side of;

B) a core of a semi-crystalline, largely isotropic, carbon foam produced from particulate high volatile

bituminous coal exhibiting a free swell index of between

about 3.5 and about 5.0 and of a small diameter, said

carbon foam having a density of between about 0.1 and

about 0.8 g/cm^3 and a thermal conductivity below about

1 W/m/°K.

12) The laminated sheet product of claim 11 wherein said coal exhibits a

free swell index of between about 3.75 and about 4.5.

13) The laminated sheet product of claim 12 wherein said skins comprise

a material selected from the group consisting of aluminum, steel, polymer

sheet, inconel, titanium, refractory metals, fiber reinforced polymer sheet

and paper.

14) The laminated sheet product of claim 12 wherein said sheet core has

been carbonized.

15) The laminated sheet product of claim12 wherein said sheet core is

graphitized.

16) The semi-crystalline, largely isotropic, carbon foam of claim 1 wherein

said high volatile bituminous coal contains between about 35% and 45%

by weight of volatile matter.

17) The semi-crystalline, largely isotropic, carbon foam of claim 16 wherein said high volatile bituminous coal has a Gieseler initial softening temperature above about 380° C.

18) The semi-crystalline, largely isotropic, carbon foam of claim 17 wherein said high volatile bituminous coal has a Gieseler initial softening temperature between about 380° C and about 400° C.

19) The semi-crystalline, largely isotropic, carbon foam of claim 16 wherein said high volatile bituminous coal has a plastic range of at least about 50° C.

20) The semi-crystalline, largely isotropic, carbon foam of claim 19 wherein said high volatile bituminous coal has a plastic range of from about 75° C to about 100° C.

21) The semi-crystalline, largely isotropic, carbon foam of claim 19 wherein said high volatile bituminous coal has a maximum fluidity of at least several hundred ddpm as determined by ASTM D2639.

22) The semi-crystalline, largely isotropic, carbon foam of claim 19 wherein said high volatile bituminous coal has a maximum fluidity of more than 2000 ddpm as determined by ASTM D2639.

23) The semi-crystalline, largely isotropic, carbon foam of claim 19 wherein said high volatile bituminous coal exhibits an expansion of at least about 20% as determined by Arnu dilatation.

24) The semi-crystalline, largely isotropic, carbon foam of claim 23 wherein said high volatile bituminous coal exhibits an expansion of at least about 100% as determined by Arnu dilatation.

25) The semi-crystalline, largely isotropic, carbon foam of claim 23 wherein said high volatile bituminous coal: 1)comprises; A) from about 50 to about 60% by weight of fixed carbon; and B) less than about 30% by weight inert maceral material; 2) exhibits a vitrinite reflectance in the range of from about 0.80 and about 0.95 as determined by ASTM D2798 and 3) exhibits 0.0 volume % moderate or severe oxidation as determined by ASTM D2798.

26) The semi-crystalline, largely isotropic, carbon foam of claim 1 having a density of between about 0.2 g/cm^3 and about 0.6g/cm^3.

27) The semi-crystalline, largely isotropic, carbon foam of claim 1 having a density of between about 0.3 g/cm^3 and about 0.4g/cm^3.

28) The method of claim 6 wherein said high volatile bituminous coal contains between about 35% and 45% by weight of volatile matter.

29) The method of claim 28 wherein said high volatile bituminous coal has a Gieseler initial softening temperature above about 380° C.

30) The method of claim 29 wherein said high volatile bituminous coal has a Gieseler initial softening temperature between about 380° C and about 400° C.

31) The method of claim 6 wherein said high volatile bituminous coal has a plastic range of at least about 50° C.

32) The method of claim 31 wherein said high volatile bituminous coal has a plastic range of from about 75° C to about 100° C.

33) The method of claim 31 wherein said high volatile bituminous coal has a maximum fluidity of at least several hundred ddpm as determined by ASTM D2639.

34) The method of claim 31 wherein said high volatile bituminous coal has a maximum fluidity of more than 2000 ddpm as determined by ASTM D2639.

35) The method of claim 31 wherein said high volatile bituminous coal exhibits an expansion of at least about 20% as determined by Arnu dilatation.

36) The method of claim 35 wherein said high volatile bituminous coal exhibits an expansion of at least about 100% as determined by Arnu dilatation.

37) The method of claim 35 wherein said high volatile bituminous coal: 1)comprises; A) from about 50 to about 60% by weight of fixed carbon; and B) less than about 30% by weight inert maceral material; 2) exhibits a vitrinite reflectance in the range of from about 0.80 and about 0.95 as determined by ASTM D2798 and 3) exhibits 0.0 volume % moderate or severe oxidation as determined by ASTM D2798.

38) The method of claim 6 wherein saidcarbon foam has a density of between about 0.2 g/cm^3 and about 0.6g/cm^3.

39) The method of claim 6 wherein said carbon foam has a density of between about 0.3 g/cm^3 and about 0.4g/cm^3.